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TRAFFIC IMPACT ANALYSIS
FOR THE

SPECIFIC PLAN FOR THE DEVELOPMENT OF STATE SURPLUS PROPERTY
FROM THE
CALIFORNIA INSTITUTION FOR MEN, CHINO, CALIFORNIA

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I. INTRODUCTION

This report documents the methods and findings of a traffic impact analysis (TIA) conducted by Kaku Associates, Inc. (Kaku) to evaluate the potential traffic impacts of the development of 717 acres of land on the northern portion of the California Institution For Men, Chino in Chino, California (CIM) (proposed project). This report identifies mitigation measures that will maintain acceptable levels of service for the surrounding roadway system. The potential traffic impacts of the proposed project have been evaluated in conformity with the *Congestion Management Program for San Bernardino County* (2001 Update, dated December 5, 2001) (CMP) and the California Environmental Quality Act (CEQA).

The City of Chino is the lead agency for the environmental analysis of the proposed project, in accordance with both CEQA and CMP authorizing legislation. The methods used in the traffic analysis have been discussed with and confirmed by staff of the lead agency and of San Bernardino Associated Governments (SANBAG). Substantial assistance has been provided by modeling staff of the Southern California Association of Governments (SCAG).

I.A. PROJECT DESCRIPTION

The proposed project would develop 717 acres land with approximately 2,300 dwelling units, up to 120,000 square feet of retail space, a campus of Chaffey Community College to serve 15,000 students, an elementary school and approximately 145 acres of parks including an expansion of the existing Ruben S. Ayala Community Park and pedestrian trails, bike paths, and equestrian trails throughout the project area. Full build-out of the residential, retail and park uses is anticipated by 2012 at which time the community college population is forecast to be 7,500 students. By 2025, it is anticipated that the community college enrollment will be 15,000 students.

The project site is located between Edison Avenue and Eucalyptus Avenue on the north, San Antonio Avenue and Euclid Avenue on the east, Central Avenue on the west and the CIM on the south. Access would be provided at Eucalyptus Avenue & Euclid Avenue, Mountain Avenue & Edison Avenue, Oaks Street & Edison Avenue and Central Avenue & A Street (a new intersection). The land is currently devoted to agricultural uses and to recreational uses, including Ruben S. Ayala Park and adjacent recreational facilities.

The location of the proposed project in the context of the surrounding roadway system is shown in Figure 1. A site plan for the proposed project is shown in Figure 2.

I.B. STUDY SCOPE

The study is directed at the analysis of potential project-generated traffic impacts on the surrounding street system. Potential impacts of the Riverside Plaza renovation project are evaluated against Year 2012 conditions (Interim Year) and 2025 conditions (Full Buildout). Five traffic scenarios are analyzed in this study for the AM and PM peak hours:

- Existing Year 2002 Conditions - Analysis of existing traffic conditions includes an assessment of the existing streets, traffic volumes, and operating conditions and is intended to provide a basis for the remainder of the study.

- Cumulative Base Interim Year 2012 Conditions - Future traffic conditions are projected for the year 2012 without the project. The objective of this phase of analysis is to project future traffic growth and the operating conditions which could be expected to result from regional growth in the vicinity of the project site, without consideration of the proposed project.

- Cumulative Plus Project Interim Year 2012 Conditions - This is an analysis of future conditions with traffic expected to be generated by the proposed project when the community college has reached one-half of its projected enrollment (7,500 students) and the remaining components of the project have been developed (residential, commercial and park uses). Traffic resulting from these components was added to the 2012 Cumulative Base forecasts, allowing the potential impacts of project traffic on future operating conditions to be identified.

- Cumulative Base Year 2025 Conditions - Future traffic conditions are projected for the year 2025 without the project. The objective of this phase of analysis is to project future traffic growth and the operating conditions which could be expected to result from regional growth in the vicinity of the project site, without consideration of the proposed project.

- Cumulative Plus Project Year 2025 Conditions - This is an analysis of future conditions with traffic expected to be generated by the full buildout of the proposed project. Traffic resulting from the proposed project was added to the 2025 Cumulative Base forecasts, allowing the potential impacts of project traffic on future operating conditions to be identified.

A scoping meeting and subsequent telephone discussions were held with staff of the City of Chino and of San Bernardino Associated Governments (SANBAG) to discuss the proposed project, the appropriate analysis locations and details of the methodology used in this study. Modeling staff of SCAG provided detailed forecasts of future traffic in the study area and also of the specific distribution of project traffic. Figure 3 shows the CMP roadway network in the vicinity of the proposed project. The CMP does not require analysis beyond 5 mile from the perimeter of the project site. The CMP intersections and highway segments selected for analysis are dependent on the amount of project-generated trips forecast to be added to the network within the defined study area, with the threshold being 80 peak hour two-way trips on the arterial street system and 100 peak hour two-way trips on the freeway system.

Based on the distribution of project trips provided by SCAG staff, the contribution of project traffic requires analysis of the Pomona Freeway (SR-60) and the Chino Valley Freeway (SR-71) and of CMP intersections within the cities of Chino, Chino Hills and Ontario. (This means that the City of Chino must notify the Congestion Management Agency (SANBAG), the California Department of Transportation, the City of Chino Hills and the City of Ontario in accordance with CMP requirements. Each of these agencies must also be provided with a copy of the CMP traffic impact analysis, once the document is accepted by the City of Chino.) In addition to the required CMP analysis locations, locally-identified intersections in the City of Chino have been analyzed. Thirty-seven intersections were identified for analysis for each of the scenarios described above. The study intersections are listed below and shown above on Figure 1.

1. Mountain Avenue & Mission Boulevard
2. Mountain Avenue & Philadelphia Avenue
3. Central Avenue & SR 60 WB Ramps

4. Central Avenue & SR 60 EB Ramps
5. Mountain Avenue & SR 60 WB Ramps
6. Mountain Avenue & SR 60 EB Ramps
7. Euclid Avenue & SR 60 WB Ramps
8. Euclid Avenue & SR 60 EB Ramps
9. Central Avenue & Walnut Avenue
10. Mountain Avenue & Walnut Avenue
11. Euclid Avenue & Walnut Avenue
12. Central Avenue & Riverside Drive
13. Mountain Avenue & Riverside Drive
14. Euclid Avenue & Riverside Drive
15. Central Avenue & Chino Avenue
16. Mountain Avenue & Chino Avenue
17. SR 71 SB Ramps & Grand Avenue/Edison Avenue
18. SR 71 NB Ramps & Grand Avenue/Edison Avenue
19. Pipeline Avenue & Edison Avenue
20. Central Avenue & Edison Avenue
21. 12th Street & Edison Avenue
22. Oaks Street & Edison Avenue
23. Magnolia Avenue & Edison Avenue
24. Mountain Avenue & Edison Avenue
25. Cypress Avenue & Edison Avenue
26. San Antonio Avenue & Edison Avenue
27. Fern Avenue & Edison Avenue
28. Euclid Avenue & Edison Avenue
29. Central Avenue & A Street (future intersection)
30. Central Avenue & Eucalyptus Avenue
31. Euclid Avenue & Eucalyptus Avenue
32. Pipeline Avenue & Chino Hills Parkway
33. SR 71 SB Ramps & Chino Hills Parkway
34. SR 71 NB Ramps & Chino Hills Parkway
35. Central Avenue & Chino Hills Parkway
36. SR 71 SB Ramps & Grand Avenue
37. SR 71 NB Ramps & Soquel Canyon Parkway

I.C. ANALYSIS METHODOLOGY

Existing traffic conditions were established through the collection of new traffic counts in the AM peak period (7 – 9 AM) and the PM peak period (4 – 6 PM) in mid-2002. These counts were supplemented by traffic data no more than 2 years old that was obtained from other traffic impact analyses and from Kaku's files.

Truck classification counts were conducted in 2002 or were obtained from the City of Chino on CMP arterials. The existing average percent of trucks was used in the conversion of trucks to passenger car equivalents (PCEs).

Project traffic volumes for all future analysis scenarios were based on trip generation rates contained in *Trip Generation, 6th Edition* (Institute of Transportation Engineers, 1997) and the San Diego Association of Governments (SANDAG) *Traffic Generators* report. The distribution of project traffic was based on select zone analysis conducted by SCAG staff using the Comprehensive Transportation Model (CTP), and separate runs were conducted for the zone containing the proposed community college and for the zones containing the other components of the proposed project. Both link volumes and intersection turning movement volumes were furnished to Kaku. The socio-economic inputs to the model resulted in a close approximation of the estimated project trips but nonetheless required Kaku to post-process the data to precisely match the estimates of project traffic.

The Year 2025 peak hour directional segment volume forecasts were determined using the growth increment approach. In this approach, the existing turning movement volumes are used as the basis for future traffic volume forecasts. The existing volumes and the forecast increment between the 2002 and 2025 segment auto volumes (23/25 of the growth increment from 2000 to 2025) plus the forecast increment between the 1994 and 2020 segment truck volumes was determined for each intersection approach and departure leg and entered into the "B-Turns" spreadsheet program. This program is consistent with the approach described by the National Cooperative Highway Research Program (*Highway Traffic Data for Urbanized Area Project Planning and Design*, NCHRP Report 255) and uses an iterative algorithm that balances the added volumes on each leg to specific intersection turning movements. At the intersections where the future configuration would be substantially different from the existing configuration (*i.e.*, a fourth intersection leg would be added as part of the proposed project), this process was refined to also utilize the project-only intersection turning movement projections provided by SCAG staff.

Project traffic volumes, as assigned by the model and provided by SCAG staff, were then added to the Year 2025 projected Cumulative Base traffic volumes. Quality control checks and forecast adjustments were undertaken to ensure that all future traffic volume forecasts reflect at least 12%

growth over existing traffic volumes. The result of these procedures is a set of traffic volume projections suitable for use in traffic operations analysis.

Interim Year 2012 background traffic volumes were interpolated from the Year 2025 traffic volumes, based on a portion of the future growth increment (10/23 of the increment from 2002 to 2025, or 43.5%).

Based on discussions with SANBAG staff, the average daily traffic volumes have been estimated based on the assumption that PM peak hour segment volumes represent 9.24% of the daily volumes.

In accordance with CMP policies, the "Operational Analysis" method from the *2000 Highway Capacity Manual* (HCM) (Transportation Research Board, 2000) was employed to perform the intersection level of service analysis. This method determines the average delay incurred per vehicle. At signalized intersections the average delay incurred by all vehicles is calculated. At unsignalized (two-way stop controlled) intersections, the average delay incurred by vehicles making each minor movement, rather than for the intersection as a whole, is calculated. The intersection level of service is related to the average stopped delay as indicated in Table 1.

The LOS analysis for signalized intersections has been conducted using optimized signal timings and, per discussions with City of Chino staff, a uniform cycle length of 90 seconds. The analysis assumed a loss time of 2 seconds per phase, consistent the default specified in the CMP guidelines. Pedestrian crossing time and signal coordination requirements have been considered in the signal timing optimization. Minimum pedestrian crossing times have been calculated as

[(curb-to-curb distance minus 6 feet)/(4 feet/second)] + 7 seconds – 4 second clearance interval.

The analysis of Existing Conditions has assumed the CMP guidelines' default saturation flow rates of 1,800 vehicles per hour of green time (vphg) for through lanes and right-turn lanes, and 1,700 vphg for single left-turn lanes, 1,600 vphg per lane for dual left-turn lanes and 1,500 vphg per lane for triple left-turn lanes. Consistent with the CMP guidelines, these saturation flow rates have been slightly increased in the analysis of future conditions (2012 and 2025) to 1,900 vphg for

through lanes and right-turn lanes, and 1,800 vphg for single left-turn lanes, 1,700 vphg per lane for dual left-turn lanes and 1,800 vphg for double right-turn lanes.

Consistent with CMP guidelines, observed peak hour factors at each intersection have been included in the analysis to account for the peak 15-minute flows that occur during the peak hour of traffic. Traffic mitigation measures were identified consistent with the ultimate roadway cross-sections presented in the General Plans of each jurisdiction. The future year peak hour factor has been adjusted upwards to 0.95. This adjustment is recommended in the CMP guidelines to account for the effect of congestion to spread the peak traffic flow more evenly across time.

Traffic mitigation measures for the future analysis years were identified and costs estimated based on standard units costs provided in the CMP. The proportion of the mitigation costs for which the proposed project would be responsible for was based on the percent of the increase in traffic between the existing and forecast future volumes that can be attributed to the proposed project.

I.D. DEFINITION OF DEFICIENCY AND SIGNIFICANT TRAFFIC IMPACT

While the CMP states that LOS E or better is acceptable, the General Plans of the Cities of Chino, Chino Hills and Ontario state that LOS D is the lowest acceptable level of service at intersections. Thus any intersection operating at LOS E or F is considered deficient. A significant traffic impact is identified if the project contributes measurable traffic to an intersection projected to operate at LOS E or F under future cumulative conditions.

For freeway facilities, the CMP definition of deficiency is applied for the purposes of this study. Thus, a freeway segment is considered deficient if it operates or is projected to operate at LOS F unless it is among those freeway segments currently operating at LOS F and is specifically as such in the 2001 CMP document.

Where a CMP deficiency has been projected, necessary mitigation measures have been identified to restore traffic operations, the project share of new traffic on the impacted CMP facility has been

calculated and the cost of improvements necessary to restore traffic operations to an acceptable level of service has been estimated.

I. E. ORGANIZATION OF REPORT

This report is divided into six chapters. The figures and tables referred to in the text are located after Chapter VI. Chapter I is the introduction. Chapter II describes the existing circulation system, traffic volumes and operating conditions within the study area and presents planned transportation improvements and their relationship to each jurisdiction's General Plan. Chapter III presents the amount and distribution of project traffic and includes a discussion of the CMP traffic contribution test. The methodologies used to forecast future traffic volumes and the resultant forecasts, are described in Chapter IV, as is an assessment of potential project traffic impacts associated with the project. Chapter V presents a summary of the cost of the identified mitigation measures and the share that can be attributed to the project. Finally, conclusions and recommendations of the study are presented in Chapter VI.

II. EXISTING CONDITIONS

This section of the report summarizes existing roadway and traffic conditions within the study area. The assessment of conditions relevant to this study includes a description of the number of through lanes on existing roadways, controls at study intersections and existing traffic volumes. These volumes were used to evaluate existing operating conditions at analyzed intersections. The study intersections are shown above on Figure 1. Existing plans for roadway improvements within the study area are also described in this section.

II.A. EXISTING ROADWAY SYSTEM

Figure 4 shows the existing lane configuration at each study intersection. Table 2 shows the existing control at each study intersection. Figure 5 shows the estimated existing average daily traffic volumes (ADT) within the study area, based on historical data which shows that PM peak hour roadway volumes average 9.24% of the daily volumes.

Regional access to the project site is provided primarily by the Pomona Freeway (SR-60) and the Chino Valley Freeway (SR-71). Local access is provided by various streets in the vicinity of the project site. The east-west arterials which will be most affected by the project include Mission Boulevard, Philadelphia Avenue, Walnut Avenue, Riverside Drive, Chino Avenue, Edison Avenue, Grand Avenue and Chino Hills Parkway. North-south arterials expected to provide local access to the project include Euclid Avenue (SR-83), Mountain Avenue, Central Avenue and Pipeline Avenue.

II.B. EXISTING TRAFFIC VOLUMES

Figure 6 shows existing intersection traffic volumes. New traffic were conducted in the AM peak period (7 – 9 AM) and the PM peak period (4 – 6 PM) in mid-2002 and used to identify the peak hour volumes. These counts were supplemented by traffic data no more than 2 years old that was obtained from Kaku's files. Explicit peak hour factors were calculated based on these counts, which are provided in Appendix A

II.C. EXISTING LEVELS OF SERVICE

The existing AM and PM peak hour volumes at each of the 36 existing study intersections were analyzed and the resulting levels of service are shown in Table 2. Detailed level-of-service worksheets are provided in Appendix B. As shown in the table, 34 of these intersections currently operate at an acceptable LOS (D or better) during the AM and PM peak hours. The three intersections currently operating at LOS E or LOS F in either the AM peak hour, the PM peak hour are:

1. Mountain Avenue & Mission Boulevard
6. Mountain Avenue & SR 60 EB Ramps
10. Mountain Avenue & Walnut Avenue

II.D. PLANNED TRANSPORTATION IMPROVEMENTS AND RELATIONSHIP TO GENERAL PLAN

The City of Chino General Plan Circulation Element and typical roadway cross-sections are shown in Figures 7 and 8, respectively. The City of Ontario General Plan Circulation Element and typical roadway cross-sections are shown in Figures 9 and 10, respectively. The City of Chino Hills General Plan Circulation Element and typical roadway cross-sections are shown in Figures 11 and 12, respectively. The County of San Bernardino General Plan Circulation Element is shown in Figures 13.

II.D.1. FUNDED ROADWAY IMPROVEMENTS

The 2012 and 2025 anticipated roadway improvements have been identified through a review of the cities' current Capital Improvement Programs (CIPs), the 2002 Regional Transportation Improvement Program (RTIP) and the CTP model. They are listed below:

The FY 2002-2003 Chino CIP indicates that the existing traffic signals at the intersections of Mountain Avenue & Walnut Avenue (Intersection 10) and Central Avenue & Chino Hills Parkway (Intersection 35) will be modified to provide westbound left-turn phasing, the construction of a traffic signal at Edison Avenue & Magnolia Avenue (Intersection 23) and Edison Avenue will be widened at Euclid Avenue (Intersection 28) to provide a 4-lane cross-section. The last of these improvements is also identified in the FY 2002/2003 – 2007/2008 Regional Transportation Improvement Program (RTIP).

The FY 2002-2003 Ontario CIP indicates that Mission Boulevard will be widened at Mountain Avenue (Intersection 1) to provide a 6-lane cross-section. This improvement is also identified in the RTIP. The RTIP also indicates that the intersection of Central Avenue & Riverside Drive (Intersection 12) will be improved with eastbound and westbound dual left-turn lanes.

In addition, the proposed project would add northbound legs to the intersections of Oaks Street & Edison Avenue (Intersection 22) and Mountain Avenue & Edison Avenue (Intersection 24), would improve the intersection of Eucalyptus Avenue & Euclid Avenue (Intersection 31) and would construct A Street, creating a new intersection at Central Avenue & A Street (Intersection 29). While improvements at these locations were necessarily assumed to be in place at these intersections in the analysis of 2012 and 2025 with project conditions, it should be noted that the estimated costs for improvements at these three intersections, which would be modified or created to provide access to the project site, are assumed to be wholly borne by the proposed project and are identified below in Chapter V.

The improvements listed above are anticipated to be complete by the year 2012 and were assumed in the analysis of traffic operating conditions in the Interim Year scenario. In the Year

2025 analysis, additional network changes in the number of through travel lanes on Edison Avenue and on Euclid Avenue (at Intersections 14, 20, 27, 28 and 31) have been obtained from the CTP model.

No other committed sources of funding for additional improvements necessary to serve the increases in traffic are in place. The analysis contained in this report, therefore, assumed minimal additional improvements beyond those anticipated in the local jurisdictions' CIPs, the RTIP and the CTP model.

III. PROJECT TRAFFIC

This chapter describes the land uses proposed by the project and the traffic characteristics for each of the future years analyzed. The CMP contribution test that was used to determine the locations for analysis is also presented in this chapter.

III.A. PROJECT DESCRIPTION

As described above in Chapter I, the proposed project would develop 717 acres land with residential, retail community college, park and open space uses. Full build-out of the residential, retail and park uses is anticipated by 2012, when the community college would serve 7,500 students. By 2025, it is anticipated that the community college enrollment will be 15,000 students. Figure 2 above presents a generalized site plan for the proposed project. In order to quantify the land uses proposed by the site, the proposed project has been divided into 10 traffic analysis zones (TAZs), which are summarized in Table 4.

III.B. PROJECT TRIP GENERATION

Trip generation estimates for the proposed project were calculated using the trip generation rates contained in *Trip Generation, 6th Edition* (Institute of Transportation Engineers [ITE], 1997) and *Traffic Generators* (San Diego Association of Governments) shown in Table 3 and the quantities shown in Table 4. Based on discussions with SANBAG staff and the specific land uses proposed by the project, no additional estimates of heavy truck traffic were made beyond the level of truck traffic included in the base trip generation rates. Following discussions with City and SANBAG staff and based on data in the *Trip Generation Handbook* (ITE, 2001), it was also agreed that trips to the retail component of the proposed project would be reduced by 30% to account for

internal capture (trips to and from the project site that would not use the surrounding street system) and pass-by trips (trips already on the system).

As shown in Table 4, in 2025 the proposed project is expected to generate approximately 4,000 trips in the AM peak hour, 5,100 trips in the PM peak hour and 53,900 daily weekday trips. The estimated trip generation of the project in the Interim Year 2012, when the community college has not yet reached its maximum anticipated enrollment, is presented in Table 5. In 2012, the proposed project is expected to generate approximately 2,900 trips in the AM peak hour, 3,900 trips in the PM peak hour and 42,300 daily weekday trips.

III.C. PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The CTP model has been used to identify the geographic distribution and assignment of project trips to specific routes on the surrounding roadway network. With the assistance of SCAG staff, traffic generated by the proposed project was modeled and two separate select zone analyses were conducted (one run for community college in TAZ A and one run for remaining components of the project in TAZs B through J). The need to use two select zones was based on the need to perform Interim Year 2012 analysis of the project and the fact that the directional distribution of trips related to the proposed community college would differ from that of the remainder of the proposed project. In addition to providing peak period and daily roadway volumes, SCAG modeling staff provided turning movements at study intersections for project traffic that were used in this analysis. The socio-economic inputs to the model resulted in a close approximation of the estimated project trips but nonetheless required Kaku to post-process the data to precisely match the estimates of project traffic. Figures 14 and 15 show the 2025 AM and PM peak hour turning movements of project traffic and Figure 16 shows the distribution of daily 2025 project trips over the surrounding network as forecast by the CTP model. Figures 17, 18 and 19 show the Interim Year 2012 AM and PM peak hour turning movement volumes and daily volumes, respectively.

III.D. CMP TRAFFIC CONTRIBUTION TEST

The CMP requires no analysis further than five miles from the perimeter of the project site. The roadway elements that must be analyzed in accordance with CMP guidelines are dependent both on the project analysis year (project opening year or CMP Horizon Year) and the project-generated traffic volumes. The identification of the study area and the study locations was based on an estimate of the two-way traffic volumes on the CMP roadway segments in the vicinity of the project site. The CMP requires that all arterial segments be included in the analysis where the forecast project volumes would equal or exceed 80 two-way trips in either the AM or the PM peak hour. The CMP requires analysis of freeway segments where forecast project volumes would equal or exceed 100 two-way trips in either the AM or the PM peak hour. Figures 20 A and 20 B presents the CMP project traffic contribution test on arterial and freeway segments adjacent to the CMP intersection analysis locations previously identified, until the project volume contribution has clearly dropped below the CMP threshold. In all, 37 intersections and 26 one-way freeway segments have been analyzed per CMP requirements. Both AM and PM peak hour volumes are required for CMP fair share traffic contribution calculations.

The proposed project contributes traffic greater than the CMP freeway threshold volume of 100 two-way peak hour trips to the Pomona Freeway (SR-60) and the Chino Valley Freeway ISR-71) and the project contribution test has indicated that the project will contribute more than 80 trips (CMP roadway threshold volume) along roadway segments serving CMP intersections within the City of Chino, the City of Chino Hills and the City of Ontario. This means that the City of Chino must notify the Congestion Management Agency (SANBAG), the California Department of Transportation, the City of Chino Hills and the City of Ontario in accordance with CMP requirements. Each of these agencies must also be provided with a copy of the CMP traffic impact analysis, once the document is accepted by the City of Chino.

IV. FUTURE CONDITIONS

This chapter describes the development of future year traffic volume forecasts and presents the resulting traffic volumes. It then presents the operations analysis for the future Cumulative Base traffic volumes and the Cumulative plus Project traffic volumes. The analysis procedures conform to the requirements set forth in the CMP guidelines. The background growth in the Interim Year 2012 have been interpolated between projected Year 2025 volumes and the existing traffic volumes utilizing a portion of the growth increment as described above in Section I.C.

IV.A. FUTURE TRAFFIC VOLUMES

As described in detail in Section I.C above, the 2025 ADT volume forecasts without the project were developed using a growth increment process based on volumes predicted by the CTP model (2000 to 2025 for autos and 1994 to 2020 for trucks). The growth increment for the Year 2025 on each roadway segment was calculated as the growth in auto volumes from Existing Year 2002 to 2025 plus the growth in truck volumes (as PCEs) from 1994 to 2020. The resulting future segment volumes were used together with the existing and segment intersection volumes to forecast Year 2025 without project roadway intersection volumes. To these volumes were added the project trips as assigned by the model to arrive at Year 2025 with Project volumes.

The Interim Year 2012 traffic projections were interpolated between the Year 2025 traffic volumes and the existing traffic volumes utilizing a portion of the growth increment as described in detail in Section I.C.

IV.A.1. INTERIM YEAR 2012 WITHOUT PROJECT

The AM and PM peak hour volumes for Interim Year 2012 without project traffic conditions were determined using the growth interpolation process as described above and in Section I.C. These volumes are presented in Figures 21A and 21B. ADT volumes were estimated based on the PM peak hour volumes as described above and are presented in Figure 22.

IV.A.2. INTERIM YEAR 2012 WITH PROJECT

The AM and PM peak hour volumes for Interim Year 2012 with project traffic conditions were determined using the growth interpolation process as described above and in Section I.C and the addition of project traffic as assigned by the model. These volumes are presented in Figures 23A and 23B. ADT volumes were estimated based on the PM peak hour volumes as described above and are presented in Figure 24.

IV.A.3. YEAR 2025 WITHOUT PROJECT

The AM and PM peak hour volumes for Year 2025 without project traffic conditions were determined using the growth increment approach as described above and in Section I.C. These volumes are presented in Figures 25A and 25B. ADT volumes were estimated based on the PM peak hour volumes as described above and are presented in Figure 26.

IV.A.4. YEAR 2025 WITH PROJECT

The AM and PM peak hour volumes for Year 2025 with project traffic conditions were determined using the growth increment approach as described above and in Section I.C and the addition of project traffic as assigned by the model. These volumes are presented in Figures 27A and 27B.

ADT volumes were estimated based on the PM peak hour volumes as described above and are presented in Figure 28.

IV.B. FUTURE TRAFFIC OPERATIONS

This section of the report presents the operations analysis for the traffic volume forecasts described above for the future Cumulative Base conditions without and future Cumulative Base plus project conditions in Year 2012 and Year 2025.

IV.B.1. INTERIM YEAR 2012 WITHOUT PROJECT

The Interim Year 2012 without project traffic volumes presented above were analyzed and the delay and level of service calculations for the study area roadway network are shown in Table 6. Delay values shown are based on the existing intersection geometry except as noted above in Section II.D.1. Level of service worksheets are presented in Appendix B.

In the Interim Year 2012 without project conditions, the following 6 study area intersections are projected to operate at LOS E or LOS F during one or both peak hours and are therefore deficient according to City of Chino criteria:

1. Mountain Avenue & Mission Boulevard
6. Mountain Avenue & SR 60 EB Ramps
10. Mountain Avenue & Walnut Avenue
14. Euclid Avenue & Riverside Drive
22. Oaks Street & Edison Avenue
31. Euclid Avenue & Eucalyptus Avenue

IV.B.2. INTERIM YEAR 2012 WITH PROJECT

The Interim Year 2012 with project traffic volumes presented above were analyzed and the delay and level of service calculations for the study area roadway network are shown in Table 7. Delay

values shown are based on the existing intersection geometry except as noted above in Section II.D.1. Level of service worksheets are presented in Appendix B.

In the Interim Year 2012 with project conditions, the 7 study area intersections listed below are projected to operate at LOS E or LOS F during one or both peak hours and are therefore deficient according to City of Chino criteria.

1. Mountain Avenue & Mission Boulevard
5. Mountain Avenue & SR 60 WB Ramps
6. Mountain Avenue & SR 60 EB Ramps
10. Mountain Avenue & Walnut Avenue
13. Mountain Avenue & Riverside Drive
14. Euclid Avenue & Riverside Drive
31. Euclid Avenue & Eucalyptus Avenue

It should be noted that the Interim Year 2012 with project conditions analysis assumed that the improvements listed below would be made at three project-adjacent intersections that would be modified or created as part of the project itself (Intersection 22 Oaks Street & Edison Avenue, Intersection 24 Mountain Avenue & Edison Avenue and Intersection 29 Central Avenue & A Street). The Interim Year 2012 operations analyses with the project and with improvements are summarized in Table 8. Improvements presented in the table include both funded improvements (see Section II.D.1) and any additional improvements necessary to achieve acceptable levels of service during the peak hours. The following intersection improvements are needed for 2012 with project conditions:

1. Mountain Avenue & Mission Boulevard
   - Second NB Left Turn Lane
   - NB Right Turn Lane
   - Second SB Left Turn Lane
   - Second WB Left Turn Lane
   - EB Right Turn Lane
   - Provide overlapping RT phasing E-W and N-S

5. Mountain Avenue & SR 60 WB Ramps
   - SB Right Turn Lane
   - provide overlapping RT phasing SB

6. Mountain Avenue & SR 60 EB Ramps
    - NB Right Turn Lane
    - provide overlapping RT phasing NB
    - Second SB Left Turn Lane

10. Mountain Avenue & Walnut Avenue
    - Additional WB Through Lane

13. Mountain Avenue & Riverside Drive
    - NB Right Turn Lane
    - SB Right Turn Lane
    - provide overlapping RT phasing SB
    - Second EB Left Turn Lane

14. Euclid Avenue & Riverside Drive
    - NB Right Turn Lane
    - SB Right Turn Lane
    - EB Left Turn Lane
    - WB Left Turn Lane

22. Oaks Street & Edison Avenue
    - First and Second NB Left Turn Lanes
    - NB Right Turn Lane
    - First and Second NB Through Lanes
    - First and Second SB Left Turn Lanes
    - SB Through Lane
    - SB Shared Through-Right Turn Lane
    - Second EB Left Turn Lane
    - Third EB Through Lane
    - EB Right Turn Lane
    - WB Dual Left Turn Lanes
    - Third WB Through Lane
    - Upgrade Existing Intersection Signalization

24. Mountain Avenue & Edison Avenue
    - NB Left Turn Lane
    - First and Second NB Through Lanes
    - NB Right Turn Lane
    - Third EB Through Lane
    - Third WB Through Lane
    - Upgrade Existing Intersection Signalization

29. Central Avenue & A Street (new intersection)
    - Install New Traffic Signal
    - WB Right Turn Lane
    - WB Left Turn Lane
    - NB Right Turn Lane
    - SB Left Turn Lane

31. Euclid Avenue & Eucalyptus Avenue
    - Install new Traffic Signal

Level of service worksheets for the Interim Year 2012 with project with improvements are presented in Appendix B. As shown in Table 8, the study area intersections are projected to operate at LOS D or better during the peak hours with the identified improvements.

IV.B.3. YEAR 2025 WITHOUT PROJECT

The Year 2025 without project traffic volumes presented above were analyzed and the delay and level of service calculations for the study area roadway network are shown in Table 9. Delay values shown are based on the existing intersection geometry except as noted above in Section II.D.1. Level of service worksheets are presented in Appendix B.

In the Year 2025 without project conditions, the following 14 study area intersections are projected to operate at LOS E or LOS F during one or both peak hours and are therefore deficient according to City of Chino criteria:

1. Mountain Avenue & Mission Boulevard
2. Mountain Avenue & Philadelphia Avenue
5. Mountain Avenue & SR 60 WB Ramps
6. Mountain Avenue & SR 60 EB Ramps
8. Euclid Avenue & SR 60 EB Ramps
10. Mountain Avenue & Walnut Avenue
13. Mountain Avenue & Riverside Drive
14. Euclid Avenue & Riverside Drive
18. SR 71 NB Ramps & Grand Avenue/Edison Avenue
22. Oaks Street & Edison Avenue
24. Mountain Avenue & Edison Avenue
26. San Antonio Avenue & Edison Avenue

28. Euclid Avenue & Edison Avenue
31. Euclid Avenue & Eucalyptus Avenue

IV.B.4. YEAR 2025 WITH PROJECT

The Year 2025 with project traffic volumes presented above were analyzed and the delay and level of service calculations for the study area roadway network are shown in Table 10. Delay values shown are based on the existing intersection geometry except as noted above in Section II.D.1. Level of service worksheets are presented in Appendix B.

In the Year 2025 with project conditions, the following 19 study area intersections are projected to operate at LOS E or LOS F during one or both peak hours and are therefore deficient according to City of Chino criteria:

1. Mountain Avenue & Mission Boulevard
2. Mountain Avenue & Philadelphia Avenue
3. Central Avenue & SR 60 WB Ramps
5. Mountain Avenue & SR 60 WB Ramps
6. Mountain Avenue & SR 60 EB Ramps
8. Euclid Avenue & SR 60 EB Ramps
10. Mountain Avenue & Walnut Avenue
11. Euclid Avenue & Walnut Avenue
13. Mountain Avenue & Riverside Drive
14. Euclid Avenue & Riverside Drive
16. Mountain Avenue & Chino Avenue
17. SR 71 SB Ramps & Grand Avenue/Edison Avenue
18. SR 71 NB Ramps & Grand Avenue/Edison Avenue
20. Central Avenue & Edison Avenue
26. San Antonio Avenue & Edison Avenue
27. Fern Avenue & Edison Avenue
28. Euclid Avenue & Edison Avenue
30. Central Avenue & Eucalyptus Avenue
31. Euclid Avenue & Eucalyptus Avenue

It should be noted that the Year 2025 with project conditions analysis assumed that the improvements listed below would be made at three project-adjacent intersections that would be modified or created as part of the project itself (Intersection 22 Oaks Street & Edison Avenue,

Intersection 24 Mountain Avenue & Edison Avenue and Intersection 29 Central Avenue & A Street). The Year 2025 operations analysis with the project with improvements is summarized in Table 11. Improvements presented in the table include both funded improvements (see Section II.D.1) and any additional improvements necessary to achieve acceptable levels of service during the peak hours. The following intersection improvements are needed for 2025 with project conditions:

1. Mountain Avenue & Mission Boulevard
   - Second NB Left Turn Lane
   - NB Right Turn Lane
   - Second SB Left Turn Lane
   - Second WB Left Turn Lane
   - EB Right Turn Lane
   - Provide overlapping RT phasing E-W and N-S

2. Mountain Avenue & Philadelphia Avenue
   - Second NB Left Turn Lane
   - Third NB Through Lane
   - NB Right Turn Lane
   - Second SB Left Turn Lane
   - Third SB Through Lane
   - SB Right Turn Lane
   - Provide overlapping RT phasing E-W and N-S
   - Second EB Left Turn Lane
   - Second WB Left Turn Lane
   - WB Right Turn Lane

3. Central Avenue & SR 60 WB Ramps
   - Convert NB Through Lane to Left Turn Lane
   - Provide overlapping RT phasing SB

5. Mountain Avenue & SR 60 WB Ramps
   - SB Right Turn Lane
   - Provide overlapping RT phasing SB

6. Mountain Avenue & SR 60 EB Ramps
   - NB Right Turn Lane
   - Provide overlapping RT phasing NB
   - Shared Left Turn/Right Turn Lane EB
   - Second SB Left Turn Lane

8. Euclid Avenue & SR 60 EB Ramps
   - Provide overlapping RT phasing NB

10. Mountain Avenue & Walnut Avenue
    - NB Right Turn Lane
    - Additional EB Through Lane
    - Additional WB Through Lane
    - NB Right Turn Lane

11. Euclid Avenue & Walnut Avenue
    - NB Right Turn Lane

13. Mountain Avenue & Riverside Drive
    - NB Right Turn Lane
    - SB Right Turn Lane
    - Provide overlapping RT phasing SB
    - Second EB Left Turn Lane

14. Euclid Avenue & Riverside Drive
    - NB Right Turn Lane
    - SB Right Turn Lane
    - EB Left Turn Lane
    - WB Left Turn Lane

16. Mountain Avenue & Chino Avenue
    - Additional NB Through Lane
    - Additional SB Through Lane

17. SR 71 SB Ramps & Grand Avenue/Edison Avenue
    - EB Right Turn Lane

18. SR 71 NB Ramps & Grand Avenue/Edison Avenue
    - Upgrade existing signal to provide overlapping RT phasing WB
    - SB Right Turn Lane
    - SB Left Turn Lane
    - WB Right Turn Lane
    - Widen Off-Ramp - NB Right Turn Lane
    - EB Right Turn Lane

20. Central Avenue & Edison Avenue
    - Second EB Left Turn Lane
    - Second WB Left Turn Lane

22. Oaks Street & Edison Avenue
    - First and Second NB Left Turn Lanes
    - NB Right Turn Lane
    - First and Second NB Through Lanes
    - First and Second SB Left Turn Lanes
    - SB Through Lane
    - SB Shared Through-Right Turn Lane
    - Second EB Left Turn Lane

- Third EB Through Lane
- EB Right Turn Lane
- WB Dual Left Turn Lanes
- Third WB Through Lane
- Upgrade Existing Intersection Signalization

24. Mountain Avenue & Edison Avenue
    - NB Left Turn Lane
    - First and Second NB Through Lanes
    - NB Right Turn Lane
    - Third EB Through Lane
    - Third WB Through Lane
    - Upgrade Existing Intersection Signalization

26. San Antonio Avenue & Edison Avenue
    - Third EB Through Lane
    - Third WB Through Lane

27. Fern Avenue & Edison Avenue
    - Install New Traffic Signal
    - Convert EB Right Turn Lane to EB Through Lane
    - Third WB Through Lane
    - EB Left Turn Lane
    - WB Left Turn Lane

28. Euclid Avenue & Edison Avenue
    - Third EB Through Lane
    - Third WB Through Lane

29. Central Avenue & A Street (new intersection)
    - Install New Traffic Signal
    - WB Right Turn Lane
    - WB Left Turn Lane
    - NB Right Turn Lane
    - SB Left Turn Lane

30. Central Avenue & Eucalyptus Avenue
    - Third NB Through Lane
    - Third SB Through Lane

31. Euclid Avenue & Eucalyptus Avenue
    - Install new Traffic Signal
    - EB Left Turn Lane
    - EB Right Turn Lane
    - WB Left Turn Lane
    - WB Right Turn Lane

Level of service worksheets for the Year 2025 with project with improvements are presented in Appendix B. As shown in Table 11, the study area intersections are projected to operate at LOS D or better during the peak hours with the identified improvements.

IV.C. CMP FREEWAY EVALUATION

As required by the CMP, an analysis of the CMP Horizon Year 2025 freeway level of service is required for all freeway segments that carry 100 or more peak hour project trips. The identification of freeway segments meeting this test was based on the assignment of 2025 project trips as forecast by the CTP model. The freeway peak hour volume forecasts have been developed based on the incremental growth for the relevant freeway segments as indicated by the peak period CTP model data for autos (2000 to 2025) and trucks (1994 to 2020). This incremental growth was added to the existing freeway traffic volumes obtained from Caltrans to develop Cumulative Base forecasts. To these volumes were added the project trips as assigned by the model to arrive at Year 2025 Cumulative Base with Project volumes. The project would contribute greater than the CMP freeway threshold of 100 two-way trips to the Pomona Freeway (SR-60) and the Chino Valley Freeway (SR-71).

Tables 12A and 12B present the analysis for Year 2025 without and with project traffic AM and PM peak hour conditions, respectively. As shown in the tables, a total of 10 freeway segments are projected to operate at an unacceptable level of service (LOS F) in the Year 2025 with project conditions during one or both peak hours.

The improvements needed to provide LOS E or better operations during the AM and PM peak hours have been determined. When possible, high-occupancy vehicle (HOV) lanes were used to provide LOS E or better. Otherwise a mixed-flow purpose lane was added. Mixed-flow lanes have an assumed capacity of 2,300 vehicles per hour while HOV lanes have an assumed capacity of 1,600 vehicles per hour. The freeway mainline segment volume-to-capacity ratios have been recalculated, together with the resulting levels of service. Tables 13A and 13B summarize the required freeway mainline improvements and the resulting levels of service for the AM and PM peak hours.

V. MITIGATION AND COST SUMMARY

V.A. CMP REQUIRED IMPROVEMENTS AND COSTS

Improvements that will eliminate all anticipated roadway operational deficiencies throughout the study area have been identified for the Interim Year 2012 and for the Buildout year 2025 (also the CMP horizon year) traffic conditions. The improvements were determined through the operations analysis described in Chapter IV.

The approximate costs for the Year 2025 have been estimated using cost guidelines in the 2001 CMP document. These guidelines are presented in Appendix C. The needed improvements and resulting costs are summarized in Table 14 for intersection and roadway links.

Table 15 summarizes the needed improvements on freeway segments. For the arterial roadway system, the funded improvements identified in Section II.D.1 were assumed to be in place in the analysis of future conditions. The total cost of the additional needed and currently unfounded roadway improvements is $10,536,000. The total cost of the additional needed freeway improvements on the segments studies is $41,170,000.

V.B. PROJECT CONTRIBUTION AND FAIR SHARE COSTS

In conformance with CMP requirements, project fair share contributions have been calculated for the Year 2025 identified improvements. The project share of the cost has been based on the proportion of project peak hour traffic contributed to the improvement location relative to the total new peak hour 2025 traffic volumes. Calculations have been made for both the AM and the PM peak hours and the maximum project contribution identified.

Tables 16A, 16B and 16C present a summary of the improvement costs and the project cost shares at each of the Year 2025 improvement locations. The intersection fair share cost calculations shown in Table 16C are based on the higher of the AM and PM peak hour contributions. It should be noted that it is assumed that the project will be responsible for 100% of the cost of improvements at the three intersections lying immediately adjacent to the project site and which will be modified or created as part of the project (Intersection 22 Oaks Street & Edison Avenue, Intersection 24 Mountain Avenue & Edison Avenue and Intersection 29 Central Avenue & A Street). As shown in Table 16C, the project's fair share of identified intersection and roadway link costs is $5,126,866.

Tables 17A, 17B and 17C summarize the needed freeway segment improvement costs and the project fair share contribution at each location. As shown in Table 17C, the project's fair share of identified freeway segment costs is $1,187,286.

The overall calculated project fair share contribution for both intersection and freeway improvements is $6,314,152.

VI. SUMMARY AND CONCLUSIONS

This chapter summarizes the findings of this traffic impact analysis and provides a series of recommendations related to project implementation.

VI.A. SUMMARY

This study was undertaken to evaluate the potential traffic impacts of the development of 717 acres of land on the northern portion of the California Institution For Men, Chino in Chino, California (CIM). The following summarizes the key findings of the study:

- The proposed project would develop 717 acres land with approximately 2,300 dwelling units, up to 120,000 square feet of retail space, a campus of Chaffey Community College to serve 15,000 students, an elementary school and approximately 145 acres of parks including an expansion of the existing Ruben S. Ayala Community Park and pedestrian trails, bike paths, and equestrian trails throughout the project area. Full build-out of the residential, retail and park uses is anticipated by 2012 at which time the community college population is forecast to be 7,500 students. By 2025, it is anticipated that the community college enrollment will be 15,000 students.

- At full build-out in 2025, the proposed project is expected to generate approximately 4,000 trips in the AM peak hour and 5,100 trips in the PM peak hour. Weekday daily trips are estimated at approximately 53,900 trips.

- In the interim analysis year (2012), the proposed project is expected to generate approximately 2,900 trips in the AM peak hour, 3,900 trips in the PM peak hour and 42,300 daily weekday trips.

- The 37 intersections and 20 one-way freeway segments selected for analysis were based on the discussions with the staff of the City of Chino and San Bernardino Associated Governments (SANBAG) and the guidelines set forth in the CMP document.

- Existing AM and PM peak hour volumes were obtained by collecting new intersection turning movement counts and from recent studies. Existing data on the percentage and type of truck traffic on CMP arterial roadways was obtained by collecting new counts, from the City of Chino and from Caltrans.

- Analysis of the existing conditions showed that 3 of the study intersections are currently operating at unacceptable levels of service in either the AM or PM peak hours.

- The Comprehensive Transportation Plan (CTP) models for autos (2000 and 2025) and trucks (1994 and 2020) were used to develop forecasts of future traffic conditions in the study area. The growth increment method was used to forecast the change in traffic volumes between the existing conditions and the 2025 CMP horizon year. The growth increment was added to existing traffic volumes and post-processed to develop forecasts of 2025 Cumulative Base conditions. The assignment of project traffic was based on intersection turning movement data from select zone analyses conducted by SCAG staff specifically for this use. The interpolation method was used to forecast Interim Year 2012 conditions.

- Analysis of the proposed project in the year 2025 showed that the project would contribute to forecast operating deficiencies at 19 study intersections and 10 freeway segments on SR-60 and SR-71.

- Analysis of the proposed project in the Interim Year 2012 showed that the project would contribute to forecast operating deficiencies at 7 study intersections.

- Improvements have been identified at each location in 2012 and 2025 that would result in acceptable operating conditions (level of service D or better at intersections; level of service E or better on freeway segments).

- Preliminary cost estimates have also been prepared for each improvement needed in the year 2025. Based on the total forecast traffic growth at each location and the portion of that growth that can be attributed to traffic related to the proposed project, the project's "fair share" contribution to these improvements is estimated to be a total of $6,314,152.

VI.B. RECOMMENDATIONS

The recommendations in this section address on-site improvements, off-site improvements and the phasing of all necessary study area transportation improvements.

VI.B.1. ON-SITE IMPROVEMENTS

On-site improvements and improvements adjacent to the site will be required in conjunction with the proposed development to ensure adequate circulation within the project area itself. A

specific plan for the project ("Chino College Park Specific Plan") is currently being prepared and will include the development standards that guide the development of the project.

VI.B.2. OFF-SITE IMPROVEMENTS

The necessary off-site improvements are described in previous sections of this report. The project should contribute towards the cost of necessary study area improvements on a proportional fair-share basis. The project should pay applicable impact fees and/or construct arterial roadway improvements adjacent to the project.

The following intersection improvements are needed for 2012 with project conditions:

1. Mountain Avenue & Mission Boulevard
   - Second NB Left Turn Lane
   - NB Right Turn Lane
   - Second SB Left Turn Lane
   - Second WB Left Turn Lane
   - EB Right Turn Lane
   - Provide overlapping RT phasing E-W and N-S

5. Mountain Avenue & SR 60 WB Ramps
   - SB Right Turn Lane
   - provide overlapping RT phasing SB

6. Mountain Avenue & SR 60 EB Ramps
   - NB Right Turn Lane
   - provide overlapping RT phasing NB
   - Second SB Left Turn Lane

10. Mountain Avenue & Walnut Avenue
    - Additional WB Through Lane

13. Mountain Avenue & Riverside Drive
    - NB Right Turn Lane
    - SB Right Turn Lane
    - provide overlapping RT phasing SB
    - Second EB Left Turn Lane

14. Euclid Avenue & Riverside Drive
    - NB Right Turn Lane
    - SB Right Turn Lane
    - EB Left Turn Lane
    - WB Left Turn Lane

22. Oaks Street & Edison Avenue
    - First and Second NB Left Turn Lanes
    - NB Right Turn Lane
    - First and Second NB Through Lanes
    - First and Second SB Left Turn Lanes
    - SB Through Lane
    - SB Shared Through-Right Turn Lane
    - Second EB Left Turn Lane
    - Third EB Through Lane
    - EB Right Turn Lane
    - WB Dual Left Turn Lanes
    - Third WB Through Lane
    - Upgrade Existing Intersection Signalization

24. Mountain Avenue & Edison Avenue
    - NB Left Turn Lane
    - First and Second NB Through Lanes
    - NB Right Turn Lane
    - Third EB Through Lane
    - Third WB Through Lane
    - Upgrade Existing Intersection Signalization

29. Central Avenue & A Street (new intersection)
    - Install New Traffic Signal
    - WB Right Turn Lane
    - WB Left Turn Lane
    - NB Right Turn Lane
    - SB Left Turn Lane

31. Euclid Avenue & Eucalyptus Avenue
    - Install new Traffic Signal

The following additional intersection improvements are needed for 2025 with project conditions:

1. Mountain Avenue & Mission Boulevard
    - Second NB Left Turn Lane
    - NB Right Turn Lane
    - Second SB Left Turn Lane
    - Second WB Left Turn Lane

- EB Right Turn Lane
- Provide overlapping RT phasing E-W and N-S

2. Mountain Avenue & Philadelphia Avenue
   - Second NB Left Turn Lane
   - Third NB Through Lane
   - NB Right Turn Lane
   - Second SB Left Turn Lane
   - Third SB Through Lane
   - SB Right Turn Lane
   - Provide overlapping RT phasing E-W and N-S
   - Second EB Left Turn Lane
   - Second WB Left Turn Lane
   - WB Right Turn Lane

3. Central Avenue & SR 60 WB Ramps
   - Convert NB Through Lane to Left Turn Lane
   - Provide overlapping RT phasing SB

5. Mountain Avenue & SR 60 WB Ramps
   - SB Right Turn Lane
   - Provide overlapping RT phasing SB

6. Mountain Avenue & SR 60 EB Ramps
   - NB Right Turn Lane
   - Provide overlapping RT phasing NB
   - Shared Left Turn/Right Turn Lane EB
   - Second SB Left Turn Lane

8. Euclid Avenue & SR 60 EB Ramps
   - Provide overlapping RT phasing NB

10. Mountain Avenue & Walnut Avenue
    - NB Right Turn Lane
    - Additional EB Through Lane
    - Additional WB Through Lane
    - NB Right Turn Lane

11. Euclid Avenue & Walnut Avenue
    - NB Right Turn Lane

13. Mountain Avenue & Riverside Drive
    - NB Right Turn Lane
    - SB Right Turn Lane
    - Provide overlapping RT phasing SB
    - Second EB Left Turn Lane

14. Euclid Avenue & Riverside Drive
    - NB Right Turn Lane
    - SB Right Turn Lane
    - EB Left Turn Lane
    - WB Left Turn Lane

16. Mountain Avenue & Chino Avenue
    - Additional NB Through Lane
    - Additional SB Through Lane

17. SR 71 SB Ramps & Grand Avenue/Edison Avenue
    - EB Right Turn Lane

18. SR 71 NB Ramps & Grand Avenue/Edison Avenue
    - Upgrade existing signal to provide overlapping RT phasing WB
    - SB Right Turn Lane
    - SB Left Turn Lane
    - WB Right Turn Lane
    - Widen Off-Ramp - NB Right Turn Lane
    - EB Right Turn Lane

20. Central Avenue & Edison Avenue
    - Second EB Left Turn Lane
    - Second WB Left Turn Lane

22. Oaks Street & Edison Avenue
    - First and Second NB Left Turn Lanes
    - NB Right Turn Lane
    - First and Second NB Through Lanes
    - First and Second SB Left Turn Lanes
    - SB Through Lane
    - SB Shared Through-Right Turn Lane
    - Second EB Left Turn Lane
    - Third EB Through Lane
    - EB Right Turn Lane
    - WB Dual Left Turn Lanes
    - Third WB Through Lane
    - Upgrade Existing Intersection Signalization

24. Mountain Avenue & Edison Avenue
    - NB Left Turn Lane
    - First and Second NB Through Lanes
    - NB Right Turn Lane
    - Third EB Through Lane
    - Third WB Through Lane
    - Upgrade Existing Intersection Signalization

26. San Antonio Avenue & Edison Avenue
    - Third EB Through Lane
    - Third WB Through Lane

27. Fern Avenue & Edison Avenue
    - Install New Traffic Signal
    - Convert EB Right Turn Lane to EB Through Lane
    - Third WB Through Lane
    - EB Left Turn Lane
    - WB Left Turn Lane

28. Euclid Avenue & Edison Avenue
    - Third EB Through Lane
    - Third WB Through Lane

29. Central Avenue & A Street (new intersection)
    - Install New Traffic Signal
    - WB Right Turn Lane
    - WB Left Turn Lane
    - NB Right Turn Lane
    - SB Left Turn Lane

30. Central Avenue & Eucalyptus Avenue
    - Third NB Through Lane
    - Third SB Through Lane

31. Euclid Avenue & Eucalyptus Avenue
    - Install new Traffic Signal
    - EB Left Turn Lane
    - EB Right Turn Lane
    - WB Left Turn Lane
    - WB Right Turn Lane

To ensure that study area roadway improvements are provided in conjunction with each phase of the proposed development as they occur, traffic impact study reports should be required with the submittal of tentative tract maps and/or specific development proposals. New traffic count data should be obtained and evaluated as individual projects are constructed.

VI.B.3. TRANSPORTATION SYSTEM MANAGEMENT ACTIONS

VI.B.3.a OFF-SITE

As development in the area occurs, transit agencies should consider expanding service within the area.

VI.B.3.b ON-SITE

The project developers should comply with the trip reduction ordinance of the City of Chino.

To accommodate future bus service on key roadways, transit stops should be anticipated at the far side of major intersections. Pedestrian access to the bus stops should be provided. The Chino College Park Specific Plan will include roadway cross-sections on Eucalyptus Avenue and on Campus Drive (the southerly extension of Oaks Street) that provide for the future implementation of such service.

REFERENCES

City of Chino, *Chino General Plan*, February 1992.

City of Chino Hills, Circulation Element of the *Chino Hills General Plan*, September 13, 1994.

City of Ontario, Ontario Specific Plan, September 15, 1992.

City of Ontario, New Model Colony (formerly Sphere of Influence) General Plan Amendment, January 7, 1998.

Institute of Transportation Engineers (ITE), *Trip Generation Manual, 6th Edition*, 1997.

San Diego Associated Governments, *Traffic Generators*.

San Bernardino County, *Congestion Management Program for San Bernardino County*, December 5, 2001.

State of California, Department of Transportation, website at *http://www.dot.ca.gov*

Transportation Research Board, *Highway Capacity Manual,* 2000.